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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/822,716	04/13/2004	Ichiro Kataoka	03500.018070.	2994
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EXAMINER				
SALZMAN, KOURTNEY R				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/822,716

Applicant(s)

KATAOKA ET AL.

Examiner

KOURTNEY R. SALZMAN

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 June 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6 and 7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6 and 7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/CIS-100)
Paper No(s)/Mail Date June 9, 2009
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Summary

1. This is the first office action on the merits for application 10/822,716 following the Request for Continued Examination filed May 8, 2009.
2. The amendment filed with the RCE has been entered.
3. Claim 1 has been amended.
4. Claims 1-4, 6 and 7 are currently pending and have been fully considered.
5. For the purpose of this action, two interpretations of the claim have been applied and rejected independently. The first interpretation reminds the applicant that this is a product claim, not a process claim, and that the limitation of using a discharge treatment to lower the contact angle doesn't carry patentable weight while in product form. Instead, in this interpretation, as long as the fluoride polymer film has the required contact angle, the claim is fulfilled, independent of the method step used to reach that angle. The second interpretation gives this feature patentable weight in the interest of compact prosecution, however the broadest reasonable interpretation (or the first interpretation) is still valid.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claim 1 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not

described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The use of the term "reduced" in reference to the contact angle with water is new matter as it has not been used to describe this angle in the specification or the claims before. The claim is even unclear as to what the angle is "reduced" relative to, causing the interpretation of the specification for understanding to be inapplicable as well.

The First Interpretation

Claim Rejections - 35 USC § 102

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
9. Claims 1 and 6 rejected under 35 U.S.C. 102(b) as being anticipated by KATAOKA et al.

KATAOKA et al teaches a photoelectric device with a solar cell element and surface protective film (or front surface member) comprising a "fluorine-containing polymer resin" in column 5, lines 12-21 and in figures 1 and 2. The front surface films are shown in these figures to be on the light incidence side and surface of the solar cell. Finally, KATAOKA et al teaches the contact angle with water to be 70 degrees or above in column 9, lines 22-24. As discussed in the description above, the requirement of a discharge treatment being applied to cause the contact angle is not necessary, as the product is what it claimed, not the process of making the product. Moreover, KATAOKA et al teaches a

discharge treatment application in column 9, lines 43-48. This is applied on the light incident surface as the member is transparent, therefore light will come to contact and reach the surface.

Regarding claim 6, KATAOKA et al teaches the fluorine-containing polymer resin to be ETFE in column 3, lines 3-6.

Claim Rejections - 35 USC § 103

10. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

11. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over KATAOKA et al (US 5,530,264), in view of MONTMARQUET (US 4,731,156).

KATAOKA et al teaches the subject matter of claim 1, as shown in the above rejection, including the discharge treatment of the surface of the photoelectric device.

KATAOKA et al fails to disclose the environment comprising inert gas and carbon dioxide in which such a surface treatment takes place.

MONTMARQUET teaches using plasma etching a fluoropolymer surface in an environment with gas mixture comprising argon, nitrogen or carbon dioxide in column 4, lines 59-64.

At the time of invention, one of ordinary skill in the art would have been motivated to modify the discharge treatment of the fluorine-containing polymer layer of KATAOKA et al to use the gas environment of MONTMARQUET because both these gases create a surface with maximum adhesion, as desired by MONTMARQUET (c. 1, l. 59-61) and KATAOKA et al (c. 9, l. 43-49).

12. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over KATAOKA et al (US 5,530,264), in view of INOUE et al (Youichi Inoue, Yasuhiro Yoshimura, Yukiko Ikeda, Akiomi Kohno, Ultra-hydrophobic fluorine polymer by Ar-ion bombardment, Colloids and Surfaces B: Biointerfaces Volume 19, Issue 3, , 30 December 2000, Pages 257-261.)

KATAOKA et al teaches all the limitations of claim 1.

KATAOKA et al fails to teach an uneven texture on the light incident surface.

Regarding claim 3, INOUE et al teaches the discharge treatment to cause a surface roughness as shown in figure 1 and discussed in section 3.1 Effects of ion bombardment conditions on surface morphology.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to cause the surface of the protective layer to have an uneven texture, as in INOUE et al because creating roughness allows for hydrophobicity, which

decreases the effect of weather elements on the solar cell and protective layer as stated in the introduction of INOUE et al.

13. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over KATAOKA et al (US 5,530,264) and INOUE et al (Youichi Inoue, Yasuhiro Yoshimura, Yukiko Ikeda, Akiomi Kohno, Ultra-hydrophobic fluorine polymer by Ar-ion bombardment, Colloids and Surfaces B: Biointerfaces Volume 19, Issue 3, , 30 December 2000, Pages 257-261.), as applied to claims 1 and 3, in view of TAWADA et al (JP 2000-058892) and in further view of NAKAMURA et al (US 6,127,623).

KATAOKA et al and INOUE et al teach the subject matter of claims 1 and 3, as shown in the above rejection.

Regarding the first limitation of claim 4 containing the mean height, TAWADA et al teaches concave-convex vertical depth to be 0.01-2 microns in paragraph 12 of the detailed description of the invention section. This corresponds to the average range described in the pending claim of the instant application.

It would have been obvious to one of ordinary skill in the art to roughen the fluoropolymer surface of KATAOKA et al and INOUE et al so that said surface has an unevenness as described in TAWADA et al in order to improve efficiency of the photoelectric device. (TAWADA et al paragraph 4 of the description of prior art section).

Neither KATAOKA et al, INOUE et al or TAWADA et al address the limits of height disclosed in the second limitation of claim 4.

Regarding the second limitation of claim 4 containing the maximum height range, NAKAMURA et al discloses a solar cell comprising a light-receptive face with a "projection depth d2 (see FIG. 9(e)) of...above 5 micrometers to about 15 micrometers" in column 2, lines 37-38.

Therefore, at the time of invention, it would have been obvious to one of ordinary skill in the art to combine the fluoropolymer surface of KATAOKA et al and INOUE et al as modified by TAWADA et al with the unevenness described in both NAKAMURA et al because this technique improves efficiency of the photoelectric devices, by increasing radiation resistance. (NAKAMURA et al c. 2, l., 10-14)

14. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over KATAOKA et al (US 5,530,264), in view of DINWOODIE (US 6,534,703).

KATAOKA et al teaches the subject matter of claim 1, as shown in the above rejection.

KATAOKA et al does not disclose the use of the multiple photovoltaic units together.

DINWOODIE teaches a photovoltaic assembly of many photovoltaic units installed at a proper inclination, angle 146 of figures 21 and 22, of typically 5-30 degrees, as stated in column 6, lines 54-55.

At the time of invention, it would have been obvious to one of ordinary skill in the art, to use the solar cell described in detail by KATAOKA et al in a multiple photovoltaic cell assembly and inclination setup of DINWOODIE because multiple units allow for more collection of energy and ranging inclination allows for adjustment with the sun to allow for more sun exposure.

The Second Interpretation

15. Claims 1, 3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over KATAOKA et al (US 5,530,264), in view of INOUE et al (Youichi Inoue, Yasuhiro Yoshimura, Yukiko Ikeda, Akiomi Kohno, Ultra-hydrophobic fluorine polymer by Ar-ion bombardment, Colloids and Surfaces B: Biointerfaces Volume 19, Issue 3, , 30 December 2000, Pages 257-261.)

KATAOKA et al teaches, in column 5, lines 12-21, "an improved photoelectric conversion device and improved photoelectric conversion module each having a multi-layer protecting member including at least a transparent resin layer disposed on the light incident side of the photovoltaic element and a transparent surface protective layer disposed at the outer-most surface outside said resin layer wherein said transparent resin layer is comprised of a specific fluorine-containing polymer resin". The limitations of claim 1, describing a solar cell

element and the front surface member, herein disclosed as a transparent surface protective layer, are clearly taught. Regarding the final limitation of claim 1, KATAOKA et al teaches the use of "discharging treatment" to be "conducted for the face of the transparent surface protective layer" in column 9, lines 43-48, as a discharge treatment. KATAOKA et al discusses the contact surface of the protective layer as an advantage in column 9, lines 22-26. KATAOKA et al states as one advantage to designing the transparent surface layer disposed on the fluororesin layer as "when the transparent surface protective layer is comprised of a resin film of 70° or above in surface contact angle against water.

KATAOKA et al teaches the application the discharge treatment, but fails to teach the application of the treatment outermost light incidence side of the polymer film to cause a controlled contact angle.

INOUE et al teaches the use of ion bombardment discharge treatment on the light incident side of a fluoride polymer sheet or layer in abstract.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to apply a discharge treatment as in INOUE et al to the outer surface of the similar film of KATAOKA et al because INOUE et al teaches the use of the discharge treatment to improve hydrophobicity to very high levels, of the most use in on the light, weather incident side. (INOUE et al conclusion)

Regarding claim 3, INOUE et al teaches the discharge treatment to cause a surface roughness as shown in figure 1 and discussed in section 3.1 Effects of ion bombardment conditions on surface morphology.

Regarding claim 6, KATAOKA et al specifically lists possible materials to be used as the fluorine-containing polymer. In column 3, lines 3-6, KATAOKA et al states material examples of "the fluorine-containing polymer thin film as the transparent surface protective film are fluororesin films such as ETFE (ethylene-tetrafluoroethylene copolymer film)..."

16. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over KATAOKA et al (US 5,530,264) and INOUE et al (Youichi Inoue, Yasuhiro Yoshimura, Yukiko Ikeda, Akiomi Kohno, Ultra-hydrophobic fluorine polymer by Ar-ion bombardment, Colloids and Surfaces B: Biointerfaces Volume 19, Issue 3, 30 December 2000, Pages 257-261., as applied to claim 1 above, in view of MONTMARQUET (US 4,731,156).

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multiple units allow for more collection of energy and ranging inclination allows for adjustment with the sun to allow for more sun exposure.

Conclusion

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KOURTNEY R. SALZMAN whose telephone number is (571)270-5117. The examiner can normally be reached on Monday to Thursday 6:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nam X Nguyen/
Supervisory Patent Examiner, Art Unit 1753

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7/15/2009